

CLAIMS

What is claimed is:

- 1 1. A computerized method of updating a content description represented as a tree
- 2 comprising:
 - 3 receiving a fragment update unit for the content description, the fragment update
 - 4 unit comprising a navigation path and an update command;
 - 5 selecting a set of nodes in the tree using the navigation path; and
 - 6 applying the update command to the set of nodes.
- 1 2. The computerized method of claim 1, wherein the navigation path is a context-based address that selects the set of nodes based on their content.
- 1 3. The computerized method of claim 2, wherein the content-based address is expressed as an XML XPath location path when the content description is coded in XML (extensible markup language).
- 1 4. The computerized method of claim 1, wherein the fragment update unit comprises a fragment payload and applying the update command comprises updating the set of nodes in the tree with the fragment payload.
- 1 5. The computerized method of claim 4, wherein the fragment update unit further comprises a plurality of fragment payloads and updating the set of nodes comprises

3 updating each one of the set of nodes with a different one of the plurality of fragment
4 payloads in a predetermined order.

1 6. The computerized method of claim 5, wherein the predetermined order is
2 determined by an ordering of all nodes in the tree.

1 7. The computerized method of claim 6, wherein the ordering of all nodes in the tree
2 is selected from the group consisting of pre-order, post-order and infix order.

1 8. The computerized method of claim 4, wherein the fragment payload is selected
2 from the group consisting of a fragment, a fragment reference, and an attribute.

1 9. The computerized method of claim 1, wherein the update command is selected
2 from the group consisting of add, delete, and replace commands.

1 10. The computerized method of claim 1 further comprising:
2 sending the fragment update unit as part of an access unit.

1 11. The computerized method of claim 1 further comprising:
2 selecting the update command;
3 formatting a fragment payload if required by the update command;
4 calculating the navigation path; and
5 creating the fragment update unit from the navigation path, the update command,
6 and the fragment payload if required.

1 12. The computerized method of claim 11, wherein formatting a fragment payload
2 comprises including an attribute identification tag when an attribute is to be updated.

1 13. The computerized method of claim 11, wherein the fragment payload is not
2 required when a fragment is to be deleted.

1 14. A computerized method of updating a content description represented as a
2 description tree comprising:

3 selecting an update command to update a set of nodes in the description tree;
4 formatting a fragment payload if required by the update command;
5 calculating a navigation path that selects the set of nodes; and
6 creating the fragment update unit from the navigation path, the update command,
7 and the fragment payload if required.

1 15. The computerized method of claim 14, wherein formatting a fragment payload
2 comprises including an attribute identification tag when an attribute is to be updated.

1 16. The computerized method of claim 14, wherein the fragment payload is not
2 required when a fragment is to be deleted.

1 17. The computerized method of claim 14, wherein the navigation path is a content-
2 based address.

1 18. The computerized method of claim 17, wherein the content-based address is
2 expressed as an XML XPath location path when the content description is coded in XML
3 (extensible markup language).

1 19. The computerized method of claim 14 further comprising formatting a plurality of
2 fragment payloads.

1 20. The computerized method of claim 14, wherein the fragment payload is selected
2 from the group consisting of a fragment, a fragment reference, and an attribute.

1 21. The computerized method of claim 14, wherein the update command is selected
2 from the group consisting of add, delete, and replace commands.

1 22. The computerized method of claim 14 further comprising:
2 sending the fragment update unit as part of an access unit.

1 23. A computer-readable medium having executable instructions to cause a computer
2 to execute a method comprising:
3 receiving a fragment update unit for a content description represented as a tree, the
4 fragment update unit comprising a navigation path and an update command;
5 selecting a set of nodes in the tree using the navigation path; and
6 applying the update command to the set of nodes.

1 24. The computer-readable medium of claim 23, wherein the navigation path is a
2 context-based address that selects the set of nodes based on their content.

1 25. The computer-readable medium of claim 24, wherein the content-based address is
2 expressed as an XML XPath location path when the content description is coded in XML
3 (extensible markup language).

1 26. The computer-readable medium of claim 23, wherein the fragment update unit
2 comprises a fragment payload and applying the update command comprises updating the
3 set of nodes in the tree with the fragment payload.

1 27. The computer-readable medium of claim 26, wherein the fragment update unit
2 further comprises a plurality of fragment payloads and updating the set of nodes
3 comprises updating each one of the set of nodes with a different one of the plurality of
4 fragment payloads in a predetermined order.

1 28. The computer-readable medium of claim 27, wherein the predetermined order is
2 determined by an ordering of all nodes in the tree.

1 29. The computer-readable medium of claim 28, wherein the ordering of all nodes in
2 the tree is selected from the group consisting of pre-order, post-order and infix order.

1 30. The computer-readable medium of claim 26, wherein the fragment payload is
2 selected from the group consisting of a fragment, a fragment reference, and an attribute.

1 31. The computer-readable medium of claim 23, wherein the update command is
2 selected from the group consisting of add, delete, and replace commands.

1 32. The computer-readable medium of claim 23, wherein the method further
2 comprises:

3 sending the fragment update unit as part of an access unit.

1 33. The computer-readable medium of claim 23, wherein the method further
2 comprises:

3 selecting the update command;
4 formatting a fragment payload if required by the update command;
5 calculating the navigation path; and
6 creating the fragment update unit from the navigation path, the update command,
7 and the fragment payload if required.

1 34. The computer-readable medium of claim 33, wherein formatting a fragment
2 payload comprises including an attribute identification tag when an attribute is to be
3 updated.

1 35. The computer-readable medium of claim 33, wherein the fragment payload is not
2 required when a fragment is to be deleted.

1 36. A computer-readable medium having executable instructions to cause a computer
2 to execute a method comprising:

3 selecting an update command to update a set of nodes in a tree representing a
4 content description;
5 formatting a fragment payload if required by the update command;
6 calculating a navigation path that selects the set of nodes; and
7 creating the fragment update unit from the navigation path, the update command,
8 and the fragment payload if required.

1 37. The computer-readable medium of claim 36, wherein formatting a fragment
2 payload comprises including an attribute identification tag when an attribute is to be
3 updated.

1 38. The computer-readable medium of claim 36, wherein the fragment payload is not
2 required when a fragment is to be deleted.

1 39. The computer-readable medium of claim 36, wherein the navigation path is a
2 content-based address.

1 40. The computer-readable medium of claim 39, wherein the content-based address is
2 expressed as an XML XPath location path when the content description is coded in XML
3 (extensible markup language).

1 41. The computer-readable medium of claim 36, wherein the method further
2 comprises formatting a plurality of fragment payloads.

1 42. The computer-readable medium of claim 36, wherein the fragment payload is
2 selected from the group consisting of a fragment, a fragment reference, and an attribute.

1 43. The computer-readable medium of claim 36, wherein the update command is
2 selected from the group consisting of add, delete, and replace commands.

1 44. The computer-readable medium of claim 36, wherein the method further
2 comprises:

3 sending the fragment update unit as part of an access unit.

1 45. A system comprising:
2 a processor coupled to a bus;
3 a memory coupled to the processor through the bus;
4 a communications interface coupled to the processor through the bus, and further
5 coupled to a communications medium; and
6 a decode process executed by the processor from the memory to cause the
7 processor to receive, through the communications interface, a fragment update unit for a
8 content description represented as a tree, wherein the fragment update unit comprises a
9 navigation path and an update command, to select a set of nodes in the tree using the
10 navigation path, and to apply the update command to the set of nodes.

1 46. The system of claim 45, wherein the fragment update unit comprises a fragment
2 payload and the decode process further causes the processor to update the set of nodes in
3 the tree with the fragment payload when applying the update command.

1 47. The system of claim 46, wherein the fragment update unit further comprises a
2 plurality of fragment payloads and the decode process further causes the processor to
3 update each one of the set of nodes with a different one of the plurality of fragment
4 payloads in a predetermined order to update the set of nodes.

1 48. The system of claim 46, wherein the fragment payload is selected from the group
2 consisting of a fragment, a fragment reference, and an attribute.

1 49. The system of claim 45, wherein the update command is selected from the group
2 consisting of add, delete, and replace commands.

1 50. A system comprising:
2 a processor coupled to a bus;
3 a memory coupled to the processor through the bus; and
4 an encode process executed by the processor from the memory to cause the
5 processor to select an update command to update a set of nodes in a tree representing a
6 content description, to format a fragment payload if required by the update command, to
7 calculate a navigation path that selects the set of nodes, and to create the fragment update
8 unit from the navigation path, the update command, and the fragment payload if required.

1 51. The system of claim 50, wherein the encode process further causes the processor
2 to include an attribute identification tag when an attribute is to be updated to format a
3 fragment payload.

1 52. The system of claim 50, wherein the fragment payload is not required when a
2 fragment is to be deleted.

1 53. The system of claim 50, wherein the encode process further causes the processor
2 to format a plurality of fragment payloads.

1 54. The system of claim 50, wherein the fragment payload is selected from the group
2 consisting of a fragment, a fragment reference, and an attribute.

1 55. The system of claim 50, wherein the update command is selected from the group
2 consisting of add, delete, and replace commands.

1 56. The system of claim 50, wherein the system further comprises a communications
2 interface coupled to the processor through the bus and further coupled to a
3 communications medium; and the encode process further causes the processor to send the
4 fragment update unit as part of an access unit through the communications interface.